SOV/129-59-3-4/16

Influence of Alloying on Hardening and Softening of Iron-base Heat-resistant Alloys

the lower will be the speed of diffusion and the better will be the high-temperature properties of the alloys. This assumption is in good agreement with the results of long-duration investigations of alloys which correspond in composition to the basic solid solution or to the same alloy alloyed separately with 2 at.% of vanadium, molybdenum or tungsten. According to preliminary data, the time-to-failure for the alloys under consideration, after hardening and slight work-hardening, subjected to a stress of 8 kg/mm^2 at a temperature of 800 °C amounted on the average to 10, 30, 50 and 100 hours, respectively. Thus, alloys containing tungsten have a high-temperature strength which surpasses all the other alloys which were investigated.

(Note: this is a complete translation.) There are 3 figures and 2 Soviet references.

Card6/6

S/129/60/000/009/003/009
E193/E483

AUTHORS: Getsov, L.B., Engineer, Zhirnov, D.F., Terekhov, K.I. and Taubina, M.G., Candidates of Technical Sciences

TITLE: The Effect of Structure on the High Temperature Properties of Alloys

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No.9, pp.12-16

TEXT: Having determined experimentally the relationship between the degree of preliminary deformation and the grain size of recrystallized material, the authors studied the effect of grain size on the mechanical properties of steel EI481 and alloy EI437B. The mechanical tests were carried out both on laboratory test pieces with a predetermined grain size and on specimens cut from finely- and coarsely-crystalline portions of industrial forgings. The short-time strength of the steel EI481 at room and elevated temperatures was not affected by the variation of the grain size. However, the time-to-rupture of specimens with the grains varying in size between 0.5 and 5 mm, and determined at 550, 600 and 650 °C, was considerably lower than that of specimens with uniform, finely-crystalline structure. U.T.S., elongation and reduction of area

Card 1/2

The Effect of Structure on the High Temperature Properties of Alloys

S/129/60/000/009/003/009
E193/E483

of alloys EI437B at 20 and 700°C, decreased with increasing grain size but the creep properties of this alloy were not affected by this factor, probably because the maximum grain size obtained (2 mm) was not sufficiently large to produce measurable effects. A.P.Ozerova, N.D.Shakhbazova, M.V.Malyutina and L.B.Aleksandrova participated in the experiments. There are 5 figures and 3 tables.

Card 2/2

ZHIRNOV, F.; BADULIN, S.; MAGAR, N.

Outstanding performance. Prof.-tekh.obr. 12 no.3:3-6 Mr '55. (MLRA 8:5)

1. Direktor uchilishcha mekhanizatsii sel'skogo khozyaystva No.1 (Sumskaya oblast'), zamestitel' direktora po uchebno-proizvodstvennoy chasti (for Zhirnov). 2. Pomoshchnik direktor po kul'turno-vospitatel'noy rabote (for Magar)
(Agricultural workers)

ZHIRNOV, F.D., inzh.; MAYSKIY, N.I., dots.; MAYSKIY, V.N., inzh.; TOCHILINA, L.V., red.; MAKAROV, M.M., nauchn.red.

[Principels of electrical engineering and the electrical equipment of tractors, combaines, and motor vehicles] Osnovy elektrotekhniki i elektrooborudovanie traktorov, kombainov i avtomobilei. Moskva, Vysshaia shkola, 1964. 219 p. (MIRA 17:12)

ZHIRNOV, F.D., inzh.; MAYSKIY, N.I., dots.; MAYSKIY, V.N., inzh.;
TOCHILINA, L.V., red.; MAKAROV, M.M., nauchn. red.

[Principles of electrical engineering and the electrical equipment of tractors, combines, and motor vehicles] Osnovy elektrotekhniki i elektrooborudovanie traktorov, kombainov i avtomobilei. Moskva, Vysshaia shkola, 1964. 219 p.
(MIRA 18:2)

SOV/19-58-2-451/685

AUTHORS: Mironov, V. D., Kaplunov, I. B., and Zhirnov, F. G.

TITLE: A Gas Extracting Device (Gazozabornoye ustroystvo)

PERIODICAL: Byulleten' izobreteniy, 1958, Nr 6, p 99 (USSR)

ABSTRACT: Class 42 l, 4_{16}. Nr 113561 (584539 of 24 Sep 1957)

Submitted to the Committee for Inventions and Discoveries at the Ministers Council of USSR. An ejector-type extractor provided with a cleaner in the form of a rod with a bent end rotated by a small water turbine driven by the stream of liquid fed into the ejector; the cleaner prevents clogging of the outlet with dust.

Card 1/1

ZHIRNOV, F. G.

231T45

USSR/Engineering - Heat, Automatic Control Jun 52

"Experiment in the Automatization of Thermal Processes," F. G. Zhirnov, Engr, Lab of Automatic Regulation, VTI, Ya. A. Fayvilevich, Engr of GRES of Mosenergo

"Iz v-s Teplotekh Inst" No 6, pp 12-19

Discusses measures developed at GRES with cooperation of VTI for complete automatization of fuel combustion processes in all boiler furnaces, automatic control of steam temp,

231T45

automatic loading of all mills, and partial automatization of coal dust transportation. Outlines immediate tasks to be accomplished by station, such as electronic system of water feeding regulation, remote control of steam and water values, remote and automatic control of temp of bearings, and other works connected with complex automatization.

231T45

MIRONOV, V.D., doktor tekhn. nauk; ZHIRNOV, F.G., inzh.

Data equipment of the control system of a thermal power block. Teploenergetika 12 no.7:12-16 Jl '65. (MIRA 18:7)

1. Vsesoyuznyy teplotekhnicheskiy institut.

ZHIRNOV, I., zasluzhennyy mekhanizator sel'skogo khozyaystva RSFSR

How much a hectare yields depends on the farmer. Sov.profsoiuzy 19 no.4:4-6 F '63.
(MIRA 16:2)

1. Sovkhoz "Zaokskiy" Moskovskoy oblasti.
(Moscow Province—Field crops) (Farm mechanization)

ZHIRNOV I.A.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

CA

7

Determination of calcium and magnesium in one solution. B. M. Perepelov and I. A. Zhirnov. *Zavodskaya Lab.* 4, 1209-11(1935).—The method of Fox (*C. A.* 7, 3042), consisting of alternate pptn. of Ca with $(NH_4)_2C_2O_4$ and Mg with Na_2HAsO_4, dissolving the mixed ppt. in H_2SO_4 and titrating first with $KMnO_4$ and then on the addn. of KI with $Na_2S_2O_3$, gives low results. However, it can be used in detns. requiring no high accuracy. C. Blanc

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SOV/86-58-8-5/37

AUTHOR: Zhirnov, I.G., Col

TITLE: Low-level Bombing Attack by a Flight (Bombardirovochnyy udar zvena s maloy vysoty)

PERIODICAL: Vestnik vozdushnogo flota, 1958, Nr 8, pp 16-25 (USSR)

ABSTRACT: The author describes in detail a map exercise carried out by a bomber squadron. The subject of the exercise was: Combat actions by a flight from low altitudes under unfavorable weather conditions in daytime against the launching sites of guided missiles. The map exercise was preceded by a lecture from which the following could be learned: Since the firing platforms of missiles at a launching site are located at considerable distances from one another, they should be aimed at and bombed individually from a low or hedge-hopping altitude, usually with the aid of an optical bombsight. The types of bombs that could be used are: demolition bombs

Card 1/2

Low-level Bombing Attack (Cont.)

SOV/86-58-8-5/37

of all calibers, general-purpose, fragmentation, and incendiary bombs. All of these, when released from low altitudes, should be armed with delay fuzes. At altitudes of 700 - 1000 m instantaneous fuzes should be used. When acting against a battery of missiles in squadron strength, the attack should be delivered by all flights simultaneously, each flight attacking its individual target, the firing platform. The flights may attack the targets either in vee or echelon formation. Aerial reconnaissance of the target prior to the attack is essential. The bombers may either approach such targets at low altitudes visually, or may be directed to the targets by a reconnaissance plane. One map.

Card 2/2

ZHIRNOV, I.G.,

Subject : USSR/Aeronautics - tactics AID P - 5119

Card 1/1 Pub. 135 - 4/26

Author : Zhirnov, I. G., Lt. Col.

Title : Tactical flight exercis[illegible] of a flight

Periodical : Vest. vozd. flota, 10, 19-22, [illegible] 1956

Abstract : A very detailed description of a tactical flight exercise (blockade of the enermy airfield by a flight of fighters) is given by the author. The article is of particular interest.

Institution : None

Submitted : No date

ZHIRNOV, I.G., polkovnik

Bombing by a flight formation from a low altitude. Vest. Vozd. Fl. 41 no.8:16-25 Ag '58.
(Bombing, Aerial) (MIRA 11:9)

ZHIRNOV, I.Ye., red.

[Economics and organization of swine breeding] Ekonomika i organizatsiia svinovodstva. Moskva, Gos.izd-vo sel'khoz. lit-ry, 1960. 288 p.
(Swine breeding) (MIRA 14:7)

ZHIRNOV, L.V.

Use of mass marking in studying the distribution and migration of saigas in the western shore areas of the Caspian Sea; preliminary report. Migr. zhiv. no.3:40-61 '62. (MIRA 16:2)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni Lenina i Astrakhanskiy gosudarstvennyy zapovednik.
(Caspian Sea region--Saiga)
(Caspian Sea region--Animals, Marking of)

ZHIRNOV, L.V.

Seasonal migrations of saiga in the western part of the Caspian Sea region. Biul.MOIP. Otd.biol. 64 no.5:134 S-O '59. (MIRA 13:6)

(CASPIAN SEA REGION--SAIGA) (ANIMALS, MIGRATION OF)

BANNIKOV, A.G., prof.; ZHIRNOV, L.V.; LEBEDEVA, L.S.; FANDEYEV, A.A.; NASIMOVICH, A.A., red.; NECHIPORUK, L.P., red. izd-va; TRUKHINA, O.N., tekhn. red.

[Biology of the saiga] Biologiia saigaka. Moskva, Izd-vo sel'khoz. lit-ry, zhurnalov i plakatov, 1961. 335 p.

(Saiga) (MIRA 15:3)

BRANNIKOV, A.G., ZHIRNOV, L.V., LEBEDEVA, L.S., FANDEYEV, A.A.

Marking saiga in the western Caspian Sea region. Migr.zhiv. no.1: 179-185.
(MIRA 13:6)

1. Moskovskiy gorodskoy pedagogicheskiy institut, Gosudarstvennyy Astrakhanskiy zapovednik.
(Caspian Sea region--Saiga) (Animals, Marking of).

ZHIRNOV, N. (Rostov-na-Donu)

Over-all automation of OSP landing systems. Grazhd.av. 13 no.2: 17-20 F '56. (MLRA 9:5)

(Landing aids (Aeronautics)) (Automatic control)

KUPERMAN, Z., inzh. (Moskva); MOROZOV, A.; ZHIRNOV, N.; POLYAKOV, V., inzh.; LUGOVOY, V. (Tbilisi); KEL'BERT, D. (Tashkent)

Technical information. Okhr. truda i sots. strakh. 5 no.9:36-40 S '62. (MIRA 16:5)

1. Starshiy inzhener avtokolonny 2200 Kirovogradskogo oblastnogo avtotransportnogo tresta (for Zhirnov).
(Technological innovations) (Safety appliances)

SOV/84-58-5-36/57

AUTHOR: Zhirnov, N., Chief of Communications and Radionavigation Service

TITLE: Introduce Factory-made Take-off Command Posts (Izgotovlyat' startovyye komandnyye punkty v zavodskikh usloviyakh)

PERIODICAL: Grazhdanskaya aviatsiya, 1958, Nr 5, p 33 (USSR)

ABSTRACT: In this letter to the Editor, the author points out the inadequacy of present take-off and landing command posts, which are mostly trucks of very different types, equipped locally. The author suggests that the Scientific Research Institute (GosNII) of the GVF prepare standard specifications based on local experience and that the posts be manufactured in factories. The author proposes

Card 1/2

Introduce Factory-made Take-off Command Posts SOV/84-58-5-36/57

placing the main transmitting and receiving set in the control tower of the larger airports. The truck should carry only a battery-powered stand-by set and the controls for the main set. In the design of the post, the following points are to be considered: a good visibility de-icing of windows, heating, ventilating, lighting of work places, and convenient arrangement of equipment. The truck must be the cross-country type, capable of moving under all road conditions, including heavy snow. Its main operational functions, such as extension and retraction of the antenna, extension of the microphone cord, communication with the searchlight station, etc. should be mechanized.

ASSOCIATION: Severokavkazskoye upravleniye GVF, Rostov-na-Donu (North Caucasian Territorial Administration of the GVF, Rostov/Don)

Card 2/2

1. Aircraft--Take-off 2. Aircraft--Landing 3. Airports--Control systems 4. Cargo vehicles--Performance

AUTHOR: ~~Zhirnov, N.,~~ Chief, Radar and Radio Navigational Service of the North Caucasian Administration of the GVF SOV/84-58-8-31/59

TITLE: Automatization of Recording of Radio Communications with Aircraft (Avtomatizatsiya zapisi radiosvyazi s samoletami)

PERIODICAL: Grazhdanskaya aviatsiya, 1958, 15 Nr 8, pp 22-23 (USSR)

ABSTRACT: The article describes an arrangement for remote and automatic control of recording of ground to air, air to ground, or airport internal communications. The new system is about to be widely introduced in the airports of the Aeroflot. Two tape recorders are used for recording. The starting, stopping, and changing over from one recorder to the other when necessary, is accomplished automatically in conjunction with turning the transmitter on or off and also the receiver. A photograph, two circuit diagrams, and two sketches of mechanical detail accompany the text.

Card 1/1

32(1)

SOV/84-59-10-36/53

AUTHOR: Zhirnov, N., Engineer

TITLE: Without the Intermediaries

PERIODICAL: Grazhdanskaya aviatsiya, 1959, Nr 10, p 26 (USSR)

ABSTRACT: The author advocates the elimination of the post of airport radio operator which, in his opinion, is an unnecessary intermediary between the dispatcher and the aircraft, and describes how the Rayonnaya dispetcherskaya sluzhba (Rayon Dispatcher Service) operates at Rostov airport without radio operators. The first dispatcher who began to work without radio operators was M. Parafonov. His idea was supported by the chief of URDS, I. Isayev, the deputy chief of airport for traffic operations, N. Kuznetsov, the chief dispatcher of RDS, P. Rubtsov, and the dispatcher F. Karaichev. Traffic is registered by the MAG-8 magnetic tape recorder, automated by a method suggested by the technician V. Shustov, and further improved by the technician M. Kharchenko. The automated tape recorder operates only during reception and

Card 1/2

Without the Intermediaries

SOV/84-59-10-36/53

transmission. When it runs out of tape, or when the tape is torn, it is automatically replaced by a reserve tape recorder. A one-km long tape is used, on an average, in one day on short-wave, and in 2 days on ultra short-wave channels. Efficiency experts are now trying to further improve it so as to make it capable of registering the beginning and the end of a contact, i.e. register three time elements (hour-minute-second). The 6-channel tape recorders are located near the command dispatcher point. The remote control desk SKT-2 has been reconstructed so as to facilitate the dispatcher's operations. The dispatcher has direct loudspeaker connection with the ADP, radio office and transmitting center. The KV-M radio receiving sets have been replaced by those of KIT type. The example set by Rostov airport has been followed by Stalingrad airport, and by the extended ADS zone of Mineral'nyye Vody airport. There is 1 photograph.

Card 2/2

BEGUCHEV, A.; ZHIRNOV, I.

Ways to develop stockbreeding. Vop. ekon. no.3:128-135 Mr '60.
(MIRA 13:2)

(Khomutovka District--Stock and stockbreeding)

ZHIRNOV, N.

Aviation and radio. Grazhd. av. 21 no.8:24-25 Ag '64.

(MIRA 18:4)

1. Nachal'nik upravleniya svyazi i radioobespecheniya poletov Glavnogo upravleniya Grazhdanskogo vozdushnogo flota.

ZHIROV, Nikolay Feodos'yevich; PANOV, D.G., doktor geogr. nauk, prof., nauchn. red.; KUMKES, S.N., red.

[Atlantis; main problems of studies on Atlantis] Atlantida; osnovnye problemy atlantologii. Moskva, Mysl', 1964. 430 p. (MIRA 17:9)

ZHIRNOV, N.I., GADZHINSKIY, T.G. (Eng.)

Mixing Machinery

Improvement of the thermal process of the asphalt-concrete mixer. Mekh. stroi. 9 no. 5, 1952

Monthly List of Russian Accessions, Library of Congress, August, 1952. UNCLASSIFIED.

N. I.

USSR/Engineering - Boilers, Auxiliary Equipment Nov 52

"Results of Reconstructing the Secondary Heating Surfaces of a Boiler Plant by the Method of VTI," Cand Tech Sci N. I. Zhirnov, Boiler Section

Iz V-S Teplotekh Inst, No 11 pp 18-23

Discusses reconstruction of 2 boilers in which worn-out plate-type air preheaters were replaced by tubular preheaters of VTI design. New preheaters are smaller, and such replacement releases space for installing additional economizers. Method reduces temp of outgoing gases by 60-100° C and decreases heat loss on average by 5% as compared with original condition of boilers before repairing. Recommends described method of grouping elements of boiler plant for new designs of high power boilers.

PA 248T80

248T80

ZLEKSEYEV, B. P.; ZHIRNOV, N. I.; SEMERIKOV, V. YE., ENGS.

Steam Boilers - Air Preheating

Increasing the economy of a 160-211 T/h boiler by using a VTI air preheater.
Elek. sta. 23 no. 8, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

ZHIRNOV, N. I.

ZHIRNOV, N. I. - "Quasi-Classical Electron Functions and Their Applications." Moscow State Pedagogical Inst imeni V. I. Lenin, Moscow, 1955. (Dissertation for the Degree of Candidate in Physicomathematical Sciences.)

SO: Knizhnaya letopis', No. 33, 1955, pp 85-87

ZHIRNOV, N.I.

Subject : USSR/Engineering AID P - 1829

Card 1/2 Pub. 110-a - 6/16

Authors : Zhirnov, N. I., and Kot, A. A., Kands. of Tech. Sci.

Title : Continuous blowdown from high-pressure boilers into the drums of medium-pressure boilers

Periodical : Teploenergetika, 3, 23-27, Mr 1955

Abstract : The authors investigated the problem at a power station equipped with both kinds of boilers. They describe the deconcentrator system used which consists of throttle valves placed in the blowdown pipes of every high-pressure boiler. These pipes are connected with a main pipeline leading the discharge into the medium-pressure boilers. This system was found to be much more economical than the blow-down into the atmosphere, and also greatly reduced scale formation on turbine blades. The authors present detailed analytical calculations of the extent of the economy obtained. They recommend the application of this system in other power stations. Three drawings.

Teploenergetika, 3, 23-27, Mr 1955 AID P - 1829

Card 2/2 Pub. 110-a - 6/16

Institution: All-Union Heat Engineering Institute

Submitted : No date

ZHIRNOV, N.I., kand.tekhn.nauk.

Water circulation in boiler of superhigh pressure under sharp load variations and constant pressure. Teploenergetika 4 no.11: 60-63 N '57. (MIRA 10:10)

1.Vsesoyuznyy teplotekhnicheskiy institut.
(Boilers)

ZHIRNOV, N.I., kand.tekhn.nauk; KROL', L.B., kand.tekhn.nauk.

Using peak-load boilers in district heating systems. Elek.sta. 28 no.9:11-18 S '57. (MIRA 10:11)

(Heating from central stations) (Boilers)

AUTHOR	ZHIRNOV, N.I.	56-5-48/55
TITLE	On the Problem of the Quasi-Classical One-Electron Functions. (K voprosu o kvaziklassicheskikh odnoelektronnykh funktsiyakh.- Russian)	
PERIODICAL	Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 5, pp 1252-1254 (USSR)	

ABSTRACT

The matrix elements of different interaction processes of matter with the radiation field are estimated with the aid of the hydrogen functions or of the Slater's functions. But the results thus obtained are unreliable from a quantitative point of view, as these functions either do not consider at all or consider only very incompletely the influence upon the radiating electron from the part of all the other electrons of the atom. The author of the paper under review construed approximate wave functions for an electron in bound states taking into account the screening influence of the electrostatic interaction of the atomic electrons upon the radiating electron. The basic concept of these computations is the combination of the statistical method devised by Thomas-Fermi (for the computation of the effective electrostatic field acting upon a single electron in the atom) with a generalized quasiclassical method for

CARD 1/3

56-5-48/55

On the Problem of the Quasi-Classical One-Electron Functions.

the computation of the wave functions in a given potential field. The effective electrostatic field acting upon the radiating electron is described in this context by a Thomas-Fermi potential with corrections for the great and small distances from the nucleus. Because this field $U(r)$ is a centrally symmetrical field, the eigenfunctions Ψ have the same angular dependence as in the hydrogen atom. Therefore the problem is reduced to the computation of the radial functions $R_{nl}(r)$ from the equation

$$d^2\mathcal{X}_{nl}(r)/dr^2+\left\{2\left[\varepsilon_{nl}-U(r)\right]-l(l+1)/r^2\right\}\mathcal{X}_{nl}(r)=0,$$

$$\mathcal{X}_{nl}(r)=r\,R_{nl}(r).$$

The solution of this equation is found with the aid of the quasi-classical method in its generalized form devised by Fok and Petrashen'. For the approximate eigenvalues of the energy ε_{nl} a formula is given. The paper under review contains the computations of the energies of the atoms Ag and In for the states 1s, 2s, 2p, 3s, 3p, 3d and 4p, as well as of the Gd-atom for the states 3p, 3d, 4p and 4d. The energy levels as computed here are in satisfactory

CARD 2/3

56-5-48/55

On the Problem of the Quasi-Classical One-Electron Functions.

agreement with the corresponding experimental values. The radial functions used in this context can also be used for the computation of the relative intensities of the lines of the K-series of the X-ray spectra of silver and of indium. The results obtained here correspond to the experimental values better than the results obtained with the aid of the hydrogen functions. (2 charts)

ASSOCIATION: Moscow State Pedagogic Institute.
PRESENTED BY: -
SUBMITTED: 13.2. 1957.
AVAILABLE: Library of Congress.

CARD 3/3

AUTHOR: Zhirnov, N. I. 51-4-2-1/28

TITLE: On Quasiclassical Single-Electron Functions. I. Bound States. (O kvaziklassicheskikh odnoelektronnykh funktsiyakh. I. Svyazannyye sostoyaniya.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.2, pp.125-137 (USSR)

ABSTRACT: In 1939 Petrashen' (Ref.1) following Fock's idea (Ref.2), developed a comparatively simple method of calculation of approximate (WKB type) single-electron wave-functions. This method made it possible to take into account the screening of the nuclear field, as well as the exchange interaction of electrons in an atom. Later the same method was reported by Miller and Good (Ref.3). In the present paper the Petrashen'-Fock method was applied to calculation of radial functions of electrons in bound states taking into account this screening effect of the electrostatic field of atomic electrons on the radiating electron. The calculations are based on a simultaneous application of the statistical Thomas-Fermi method (Ref.4) for calculation of the effective electrostatic field which acts on a single electron in a heavy atom, together with

Card 1/3

On Quasiclassical Single-Electron Functions. I. 51-4-2-1/28

the quasiclassical method of calculation of wave-functions in a given potential field. The author used a Thomas-Fermi potential corrected at both short and long distances from the nucleus. The author calculated single-electron quasiclassical radial wave-functions for the 1s, 2s, 2p, 3s, 3p, 3d and 4p states of silver and indium atoms. These wave-functions were used to calculate the relative intensities of the K-series lines of X-ray spectra of silver and indium. These intensities are given in Table 4. Satisfactory agreement was found between the calculated values and the experimental data of Refs.10 and 11. The author developed a method for an approximate representation of the quasiclassical single-electron wave-functions in an analytic form. The author concludes that using the Petrashen'-Fock method we can find approximate single-electron functions which take into account field structure in complex atoms, without numerical integration of the Schrödinger equation. Even the approximate radial functions obtained on the basis of the rather coarse Thomas-Fermi model allow us to study in a fairly precise manner some of the processes in more

Card 2/3

On Quasiclassical Single-Electron Functions. I. 51-4-2-1/28

complex atoms. This paper is entirely theoretical. The author thanks B.T. Geylikman for suggesting the subject and directing the work. There are 1 figure, 4 tables, 11 references of which 7 are Soviet, 2 English and American, 1 German and 1 Hungarian.

ASSOCIATION: Moscow State Pedagogical Institute imeni V.I. Lenin. (Moskovskiy gosudarstvennyy pedagogicheskiy institut im. V.I. Lenina.)

SUBMITTED: May 21 1957.

1. Electrons-Radiation-Mathematical analysis 2. Thomas-Fermi theory-Applications 3. Electrons-Motion-Theory 4. Electrons-Effect of electrostatic field 5. Electrons-Radial wave functions

Card 3/3

51-4-2-2/28

AUTHOR: Zhirnov, N. I.

TITLE: On Quasiclassical Single-Electron Functions. II. Continuous Spectrum States. (O kvaziklassicheskikh odnoelektronnykh funktsiyakh. II. Sostoyaniya nepreryvnogo spektra.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.2, pp.138-143 (USSR).

ABSTRACT: Using the method described in Part I (Ref.1, see the preceding abstract) the author calculated quasiclassical single-electron radial wave-functions for electron states in a continuous spectrum. The results were obtained by solution of the radial Schrödinger equation for an electron in an electrostatic Thomas-Fermi field. It is shown that at sufficiently high positive energies the radial eigenfunctions of an electron differ only a little from the corresponding hydrogen functions. The paper is entirely theoretical. There are 1 table, and 5 references of which 4 are Soviet and 1 American.

ASSOCIATION: Moscow State Pedagogical Institute imeni V.I. Lenin (Moskovskiy gosudarstvennyy pedagogicheskiy institut im. V.I. Lenina.)

Card 1/2

51-14-2-2/28

On Quasiclassical Single-Electron Functions. II.

SUBMITTED: May 21, 1957.

1. **Schrodinger equations-Applications 2. Electrons-Radiation-Mathematical analysis 3. Electrons-Radial wave functions**

Card 2/2

ZHIRNOV, N.I.

ZHIRNOV, N.I., kand.tekhn.nauk; RATNER, A.V., kand.tekhn.nauk.

Small fittings for installations with very high steam parameters.
Elek.sta. 29 no.1:11-14 Ja '58. (MIRA 11:2)
(Boilers--Safety appliances)

L 3922-66 EWT(l) IJP(c)
ACCESSION NR: AP5017888

UR/0051/65/019/001/0006/0011
539.192

28
B

AUTHOR: Zhirnov, N. I. 44,55

TITLE: On the true nature of the Rydberg-Klein-Rees method

SOURCE: Optika i spektroskopiya, v. 19, no. 1, 1965, 6-11

TOPIC TAGS: molecular spectroscopy, diatomic molecule, quantum oscillator

ABSTRACT: The purpose of this paper was to determine why the Rydberg-Klein-Rees (RKR) method for constructing potential energy curves for diatomic molecules from 17,44,55 quasi-optical data leads to excellent results in regions where it would not be useful if it is assumed that the method is quasiclassical, and to poorer results in regions where the condition of quasiclassical motion of the molecules is more valid. To this end, the author proves that the RKR method is really a consequence of the generalized WKB method, not of the usual WKB method, and corresponds to the case where the vibrational properties of a diatomic molecule are approximated by using the anharmonic Morse oscillator. Since the RKR is thus not a quasiclassical method, there is a necessity for further improving it by choosing a potential whose asymptotic behavior is closer to that of the true potential curve. Orig. art. has: 19 formulas.

Card 1/2

L 3922-66

ACCESSION NR: AP5017888

0

ASSOCIATION: none

SUBMITTED: 13Apr64 ENCL: 00 SUB CODE: OP

NR REF SOV: 002 OTHER: 010

Card 2/2

L 24305-66 EWT(1)/T IJP(c) AT

ACC NR: AP6006996 SOURCE CODE: UR/0051/66/020/002/0224/0229

52
B

AUTHOR: Zhirnov, N. I.; Vasilevskiy, A. S.

ORG: none

TITLE: Application of the generalized WKB method to the study of the vibrational-rotational spectra of diatomic molecules. I. Vibrational-rotational spectrum of a Morse oscillator

SOURCE: Optika i spektroskopiya, v. 20, no. 2, 1966, 224-229

TOPIC TAGS: molecular spectrum, vibration spectrum, approximation method, hydrogen, quantum oscillator, perturbation theory

ABSTRACT: The authors propose a simpler method for calculating vibrational-rotational energy levels of diatomic molecules, using a generalized WKB method in a form close to that previously derived by one of the authors (Zhirnov, Opt. i spektr. v. 17, 643, 1964). The ground electronic state of the hydrogen molecule is considered as an example, under the assumption that the actual potential curve of the molecule can be sufficiently accurately approximated by a Morse potential function. The vibrational-rotational levels thus obtained are compared with the existing experimental data and with the results of the calculation by perturbation-theory methods. The calculated results are systematically high by roughly 100 cm^{-1} compared with the experimental values. The causes for the various discrepancies are briefly discussed. The authors thank A. N. Zavaruyeva for assistance with the numerical computer work. Orig. art. has: 22 formulas and 1 table.

SUB CODE: 20/ SUBM DATE: 07Dec64/ ORIG REF: 004/ OTH REF: 006

Card 1/1 ftv UDC: 535.338.42.001.1

ACC NR: AP7005733 SOURCE CODE: UR/0139/66/000/006/0101/0107

AUTHOR: Zhirnov, N. I.

ORG: Moscow Pedagogical Institute im. V. I. Lenin (Moskovskiy pedinstitut)

TITLE: Penetration probability of a potential barrier in an approximation of the generalized Wentzel-Kramers-Brillouin method Part 2 Symmetrical barriers

SOURCE: IVUZ. Fizika, no. 6, 1966, 101-107

TOPIC TAGS: potential barrier, approximation method, approximation solution, penetration coefficient, Wentzel Kramers Brillouin method

ABSTRACT: This study was undertaken in an attempt to eliminate the drawback of the approximate method in computing the penetration coefficients through one-dimensional potential barriers (N. I. Zhirnov, Izv. vuzov, SSSR, Fizika, No. 4, 28, 1965). Such deficiency is removed in this work by superposing some complementary conditions on the base potential W(S). A new solution is given to the problem of the penetration of particles through symmetrical barriers. Orig. art. has: 26 formulas and 4 tables. [Author's abstract] [NT]

SUB CODE: 20/SUBM DATE: 07Jul65/ORIG REF: 003/OTH REF: 002/

Card 1/1

ACC NR: AP7005734 SOURCE CODE: UR/0139/66/000/006/0108/0113

AUTHOR: Zhirnov, N. I.

ORG: Moscow State Pedagogical Institute im. V. I. Lenin (Moskovskiy gosped-institut)

TITLE: Penetration probability of a potential barrier in approximation of the generalized Wentzel-Kramers-Brillouin method Part 3 Asymmetrical barriers

SOURCE: IVUZ. Fizika, no. 6, 1966, 108-113

TOPIC TAGS: potential barrier, approximation method, particle energy, approximate solution, particle motion, Wentzel kramers Brillouin method

ABSTRACT: The present study is a continuation of an earlier study on the penetration probability of a potential barrier. A new solution is derived for the problem of the penetration of particles through one-dimensional asymmetrical barriers; the solution is more precise than the previous one (N. I. Zhirnov, Izv. vuzov, SSSR, Fizika, No. 4, 28, 1965). The problem is discussed concerning the limits of applicability of the generalized Wentzel-Kramers-Brillouin method for

Card 1/2

ACC NR: AP7005734

computing the penetration probabilities of one-dimensional barriers. The approximate solutions derived from using the Wentzel-Kramers-Brillouin method are found to be valid over the entire range of changes in particle energy. The author thanks M. S. Rabinovich for discussing the study and L. A. Kronrod for assistance in calculations. Orig. art. has: 44 formulas. [Based on author's abstract] [NT]

SUB CODE: 20/SUBM DATE: 07Jul65/ORIG REF: 006/OTH REF: 001/

Card 2/2

ZHIRNOV, N.I.

Normalization and exactness criteria of quasi-classical solutions to Dirac's radial equations. Izv. vys. ucheb. zav.; fiz. no.5: 125-130 '64. (MIRA 17:11)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni Lenina.

ZHIRNOV, N.I.

Quasi-classical wave functions of Morse's oscillator and their use in calculating Franck-Condon factors. Part 1. Opt. i spekt. 15 no. 2:166-175 Ag '63. (MIRA 17:1)

TITLE: Quasiclassical wave functions of a Morse [illegible] [illegible]lating Franck-Condon factors. 2. Re[illegible]

[illegible]

SOURCE: Optika i spektroskopiya, v. 1[illegible]

TOPIC TAGS: wave function, Franck-Condon [illegible] Morse [illegible]

[illegible]

ABSTRACT: Investigation of the intensity [illegible] al spectra bands of diatomic molecules [illegible]

[illegible]

Card 1/2

SUBMITTED: 02Jan63

DATE ACQ: 06Sep63

ENCL: 00

SUB CODE: PH

NO REF SOV: 008

OTHER: 003

Card 2/2

ZHIRNOV, N.I.

Estimate of the accuracy of Sverdlov sum rules. Opt. i spektr.
14 no.4:580-582 Ap '63. (MIRA 16:6)

(Molecular spectra)

ZHIRNOV, N.I., kand.tekhn.nauk; DZHURIKHIN, S.P., inzh.

Operating peak load boiler PTVM-50-1 on mazut. Gor. khoz. Mosk. 36 no.6:37-40 My '62. (MIRA 15:7)

1. Vsesoyuznyy teplotekhnicheskiy institut.
(Boilers)

ZHIRNOV, N.I.

Quasi-classical solutions of the Dirac radial equations. Zhur. eksp.i teor.fiz. 37 no.6:1619-1625 D '59. (MIRA 14:10)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut.
(Differential equations) (Electrons)

ZHIRNOV, N.I., kand.tekhn.nauk

Experiment in the start-up, adjustment and operation of a peak-load PTV-100 water-heating boiler for district heating. Teploenergetika 8 no.9:20-24 S '61. (MIRA 14:8)

1. Vsesoyuznyy teplotekhnicheskiy institut.
(Boilers)

ZHIRNOV, N.I.

Interpretation of the vibrational spectra of naphthalene and its deuterated analogue. Opt. i spektr. 9 no. 6:734-741 D '60. (MIRA 14:1)

(Naphthalene--Spectra)

ZHIRNOV, N.I.

Letter to the editor. Elek.sta. 31 no.5:93
My '60. (MIRA 13:8)
(Boilers)

ZHIRNOV, N.I., kand.tekhn.nauk; KROL', L.B., kand.tekhn.nauk; LIVSHITS, E.M., inzh.; RABKIN, Yu.I., inzh.

Peak-load boilers used in district heating systems. Energetik 8 no.6:28-34 Je '60. (MIRA 13:7)
(Boilers)

S/051/60/009/006/006/018
E201/E191

AUTHOR: Zhirnov, N.I.

TITLE: Interpretation of the Vibrational Spectra of Naphthalene and its Deuterated Derivative

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.6, pp 734-741

TEXT: The author reports a new, more accurate, interpretation of the vibrational spectra of naphthalene and octadeuteronaphthalene ($C_{10}H_8$ and $C_{10}D_8$). The author used mainly the experimental work of Lippincott and O'Reilly (Ref.1). Values of some frequencies were taken from McLellan and Pimentel's work (Ref.2), and the 176 cm^{-1} frequency was taken from the paper of Person, Pimentel and Schnepp (Ref.7). Approximate values of interatomic distances and valence angles were used (a figure on page 735). These distances and angles allowed for the fact that naphthalene belongs to the point symmetry group D_{2h} and they were quite similar to the experimental values reported by Robertson (Ref.8). The calculated fundamental frequencies are listed in a table on pages 739-740. The results obtained by the present author are listed in columns 4 and 5; those obtained by Lippincott and

Card 1/2

S/051/60/009/006/006/018
E201/E191

Interpretation of the Vibrational Spectra of Naphthalene and its Deuterated Derivative

O'Reilly (Ref.1) are given in columns 6 and 7, whilst McLellan and Pimentel's values are listed in columns 8 and 9. The new values of the fundamental frequencies of naphthalene and octadeuteronaphthalene were used to find more accurate values of the force constants of naphthalene.

Acknowledgement is made to E.V. Shpol'skiy for his advice.

There are 1 figure, 1 table and 11 references: 4 Soviet, 5 English, 1 German and 1 translation from English into Russian.

SUBMITTED: March 12, 1960

Card 2/2

ZHIRNOV, N.I.

Energy levels of μ-mesic atoms. Zhur.eksp.i teor.fiz. 38 no.3:959-962 Mr '60. (MIRA 13:7)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut.
(Mesons)

ZHIRNOV, N.I.

Photoelectric absorption of X rays in silver on the L and M shells. Uch.zap.MGZPI no.3:252-261 '59. (MIRA 13:5)
(X rays) (Silver)

76977
SOV/56-37-6-17/55

16.8000, 16.8100, 16.8300

AUTHOR: Zhirnov, N. I.

TITLE: Quasi-Classical Solution of the Radial Dirac Equations

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1619-1625 (USSR)

ABSTRACT: Equations were derived for the extension of the WKB method (cf. L. A. Young, G. E. Uhlenbeck, Phys. Rev., 36, 1154, 1930), which is applicable to the solution of the radial Dirac equations for bound states of electrons in an atom. Approximate solutions of the Dirac equations were expressed in terms of solutions of similar equations for an electron in a hydrogen-like atom. Radial Dirac equations for the relativistic electron moving in a central-symmetrical field U(r) can be expressed in the form:

Card 1/4

Quasi-Classical Solution of the Radial Dirac Equations

76977
SOV/56-37-6-17/55

$$\psi_2\Phi_1/\hbar c + d\Phi_2/dr - \varkappa\Phi_2/r = 0,$$
$$\psi_1\Phi_2/\hbar c - d\Phi_1/dr - \varkappa\Phi_1/r = 0.$$

where

$$\psi_1 = W + mc^2 - U(r);\quad \psi_2 = W - mc^2 - U(r);\quad \Phi_1(r) = rg(r);$$
$$\Phi_2(r) = rf(r);$$

Here, g(r) and f(r) are large and small components of the electron wave function; W is relativistic energy of electron (including its energy at rest); $\varkappa$ is quantum number defined by relations:

$$\varkappa = -(l+1) \text{ WHEN } j = l + 1/2,\quad \varkappa = l \text{ WHEN } j = l - 1/2.$$

The solution of the above equations was sought in the form:

$$\Phi_1(r) = [A_0(r) + \hbar A_1(r) + \ldots]\exp[i\gamma(r)/\hbar];$$
$$\Phi_2(r) = [B_0(r) + \hbar B_1(r) + \ldots]\exp[i\gamma(r)/\hbar].$$

Card 2/4

Quasi-Classical Solution of the Radial Dirac Equations

76977
SOV/56-37-6-17/55

The method was developed for the representation of the approximate solutions in analytical form. The obtained approximate single-electron functions are continuous throughout the entire region of the change in the field. Therefore, there is no need of establishing the special coupling equation as it is necessary by the Young-Uhlenbeck method (loc. cit.) The equation of eigen values during the transformation into nonrelativistic approximation coincides with the quantification rule of M. I. Petrashen (Doklady Akad. nauk SSSR, 50, 147, 1945; Uchenye zap. Leningrad gos. univ., Ser. fiz., 7, 59, 1949). The shortcoming of the developed method lies in the uncertainty of the magnitude of the error introduced by the approximation of the wave function. However, this error is considerably smaller than is the case with the equations of Young-Uhlenbeck and R. H. Good (Phys. Rev., 90, 131, 1953). As an illustration, the derived equations were used in the calculation of the fine structure of M terms of the Hg atom includ-

Card 3/4

Quasi-Classical Solution of the Radial Dirac Equations

76977
SOV/56-37-6-17/55

ing compensation for the screening effect of the Coulomb field. There are 2 tables; and 6 references, 4 Soviet, 2 U.S. The U.S. references are: L. A. Young, G. E. Uhlenbeck, Phys. Rev., 36, 1154, 1930; R. H. Good, Phys. Rev., 90, 131, 1953.

ASSOCIATION: Moscow State Pedagogical Inst., USSR (Moskovskiy gosudarstvennyy pedagogicheskiy institut, SSSR)

SUBMITTED: March 16, 1959

Card 4/4

SOV/96-59-7-9/26

AUTHORS: Zhirnov, N.I. and Krol', L.B., Candidates of Technical Sciences, Glazov, S.V. and Shchedrin, F.B., Engineers

TITLE: A Large Peak-load Boiler House for Rational Heat Supply to Urban Districts where Extensive Housing Construction is Going on. (Krupnaya pikovaya kotel'naya dlya ratsional'nogo teplosnabzheniya rayonov massovoy zastroyki gorodov)

PERIODICAL: Teploenergetika, 1959, Nr 7, pp 36-41 (USSR)

ABSTRACT: During the period 1959-1965 there will be a great deal of new housing construction in a number of towns. The supply of heat to such housing presents a number of problems. The provision of individual boilers for each house is expensive and wasteful. Existing designs of regional boiler-houses are expensive and are not well-adapted to the eventual use of district-heating power stations. Again, large district-heating power stations to supply the heat and in particular to cover peak loads, could not be constructed immediately. Such stations should incorporate large cheap water-heating boilers to cover the peak loads, thereby reducing the cap-

Card 1/6

SOV/96-59-7-9/26

A Large Peak-load Boiler House for Rational Heat Supply to Urban Districts where Extensive Housing Construction is Going on

ital cost of the stations by more than 15%. Although suitable boilers have been developed by the All-Union Thermo-Technical Institute in collaboration with the Moscow Branch of the 'Orgenergostroy' Institute, district-heating power stations cannot solve the immediate problem because their construction must lag behind that of the housing. It was accordingly necessary to develop large, cheap water-heating boiler-houses, with peak boilers of the All-Union Thermo-Technical Institute design, sited directly amongst the housing or adjoining existing or future district-heating power stations. At first, these boilers will be the main source of heat supply; later, when the district-heating stations have been constructed, they will be used to cover peak loads. The cost of such boiler houses together with the heating systems is about 107 000 roubles per Mkcal/hr of thermal output, or about 20 roubles per square metre of living space; and the cost of heat produced is about 25 roubles per Mkcal/hr, which is considerably less than with any other sort of heat

Card 2/6

SOV/96-59-7-9/26

A Large Peak-load Boiler House for Rational Heat Supply to Urban Districts where Extensive Housing Construction is Going on

supply. The All-Union Thermo-Technical Institute has developed the design for such a peak water-heating boiler installation and together with the Moscow Planning Institute has compared the economics of a number of different methods of heat supply. A detailed description of the boiler house is then given, and the general arrangement is illustrated in Figure 1. It will contain three water-heating boilers type PTV-100, each with a thermal output of 100 Mkcal/hr, a furnace volume of 246 m^3, a radiation heating surface of 396.7 m^2, a convective heating surface of 2 280 m^2, and a mean efficiency of 93.8%. The thermal output of the boiler house suffices for a typical district with a total housing area of 1565 000 m^2. For smaller sites two boilers type PTV-100, or two or three similar boilers type PTV-50, may be used. The boiler house is designed to burn natural gas and will thus meet the requirements of Moscow, Kiyev, Leningrad, Khar'kov, Rostov-na-Donu, L'vov and a number of other towns. Stand-by fuel-oil-burning equipment is provided, increasing the cost of the boiler house by about 20%. As gas fail-

Card 3/6

SOV/96-59-7-9/26

A Large Peak-load Boiler House for Rational Heat Supply to Urban Districts where Extensive Housing Construction is Going on

ures are not likely to last more than a few hours, this equipment may prove unecessary. As will be seen from the arrangement diagram given in Figure 2, the station has water-treatment equipment and system pumps for use until the district-heating station is constructed. Later on, when the boiler house is only covering peak loads, these accessories may be removed; alternatively, the corresponding equipment in the associated district-heating stations may be smaller. De-aerators are installed. The water-treatment plant is of the sodium-cationite type, and stores are provided for the necessary chemicals. The gas and fuel-oil supply arrangements are briefly described. Boilers type PTV-100 operate on natural draught and each burner has its own draught fan. The common steel smoke-stack is erected on the middle boiler. A central control panel is provided. When fuel-oil is burned special measures are taken to prevent contamination of the convective surfaces. Arrangements are made to deliver caustic magnesite or lime to the

Card 4/6

SOV/96-59-7-9/26

A Large Peak-load Boiler House for Rational Heat Supply to Urban Districts where Extensive Housing Construction is Going on

upper part of the furnace in order to make the deposits friable. If the water returned from the district-heating system is below the dew point of the furnace gases, it is heated by circulation of hot water. Provision is also made to wash the convective surfaces of the boiler with hot water, to remove deposits. A thermal load curve for Moscow, given in Figure 4, shows that the boiler house will operate for only 25 - 30 hours per year with the full thermal load of 300 Mkcal/hr, and that the load would be above 80% for not more than 400 hours per year. During the summer the load would not exceed 60% of the capacity of one boiler and so this period can safely be used for general overhaul. When the boiler house is covering only peak loads, its output will still further be reduced, even if new consumers are connected in the meantime. When this occurs it will be possible to use only two boilers, keeping the third in reserve. It has been calculated that the boilers will be hydro-dynamically stable with a water-flow rate differing from the rated value by 20%. In the early

Card 5/6

SOV/96-59-7-9/26

A Large Peak-load Boiler House for Rational Heat Supply to Urban Districts where Extensive Housing Construction is Going on

stages, before all the housing is constructed, still lower flow-rates may be required and it will then be necessary to re-circulate water through the boilers. A high degree of automation will be used and so it is expected that the boiler house will be operated by shifts of three men each. The total cost of construction of the boiler house is about 6 400 000 roubles, of which the fuel-oil handling installation costs 1 073 000 roubles. The main performance and cost data are tabulated for the new boiler house and for the old type KG-10, which is much more expensive. It is concluded that large peak boiler houses with water-heating boilers types PTV-100 or PTV-50 have considerable advantages over smaller boiler houses, including those with boiler type KB-10, in respect of both capital and running costs. Therefore, only boiler houses of this kind should be constructed in districts with extensive new housing construction. There are 4 figures, 1 table and 1 Soviet reference.

ASSOCIATION: Vsesoyuznyy teplotekhnicheskiy institut (All-Union Thermo-Technical Institute)

Card 6/6

BRAUDE, I.Ye.; ~~ZHIRNOV, N.I.;~~ PARSHIN, A.A.; ROZENGAUZ, I.N.; STENING,
A.I.; UVAROV, V.V. [deceased]; AYZENSHTAT, I.I., red.; ZHIRNOV,
N.I., red.; LARIONOV, G.Ye., tekhn.red.

[Modern boiler units; essential components and devices]
Sovremennye kotel'nye agregaty; osnovnye elementy i ustroistva.
Pod red. I.E.Braude. Moskva, Gos.energ.izd-vo, 1959. 247 p.
(Boilers) (MIRA 12:8)

ZHIRNOV, N.I.

Interpretation of the vibrational spectrum of coronene. Opt. i spektr. 6 no.2:162-167 F '59. (MIRA 12:4)
(Coronene--Spectra)

ZHIRNOV, N.I., kand. tekhn. nauk.

Water circulation in the piping of superhigh-pressure boilers during kindling. Elek. sta. 30 no.3:23-28 Mr '59. (MIRA 12:5)

(Boilers)

AUTHOR: Zhirnov, N.I. SOV/51-6-2-6/39

TITLE: On the Problem of Interpretation of the Vibrational Spectrum of Coronene (K voprosu ob interpretatsii kolebatel'nogo spektra koronena)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 2, pp 162-167 (USSR)

ABSTRACT: Extensive experimental data on the vibrational spectrum of coronene ($C_{24}H_{12}$) are already available (Refs 1-3). Interpretation of this spectrum, however, still meets with difficulties. The most reliable method of determination of the symmetry of the vibrational frequencies, based on comparison of the Raman with the infrared spectrum, cannot be applied because these spectra of coronene have not yet been reported. The point symmetry group D_{6h} is deduced from similarity of coronene and benzene. Shpol'skiy (Ref 2) pointed out that this similarity goes further and that the strongest benzene frequencies are also present in the coronene spectrum. Among such frequencies are the 992 cm^{-1} fully symmetrical vibration of the benzene ring and 3070 cm^{-1} which is close to 3062 cm^{-1} of fully symmetrical vibrations of C--H bonds in benzene. The present paper shows that this similarity between coronene and benzene spectra is due to the central benzene ring in coronene. The conclusions arrived at are deduced from consideration of currents due

Card 1/2

SOV/51-5-2-6/39

On the Problem of Interpretation of the Vibrational Spectrum of Coronene

to shared π-electrons in coronene (Fig 1) and from an estimate of frequencies of certain normal vibrations of coronene. The central benzene ring in coronene is very weakly bound with the remaining parts of the coronene molecule and, therefore, behaves similarly to the carbon skeleton of free benzene. Consequently the frequencies characteristic of vibrations of the carbon skeleton of benzene are reproduced in the vibrational spectrum of coronene. The presence of frequencies, characteristic of C--H bond vibrations in benzene, in the spectrum of coronene is due to the fact that their force interaction in coronene is practically the same as their interaction in benzene. Acknowledgements are made to E.V. Shpol'skiy and L.S. Mayants for their advice. There are 2 figures, 1 table and 9 references, 6 of which are Soviet, 2 English and 1 French.

SUBMITTED: April 3, 1958

Card 2/2

L 13005-66 EWT(1) IJP(c)
ACC NR: AP6001636

SOURCE CODE: UR/0051/65/019/006/0871/0873

AUTHOR: Zhirnov, N. I.; Kronrod, L. A.

45
44
B

ORG: none

TITLE: Quasiclassical wave functions for a Morse oscillator and their use in calculating Franck-Condon factors. III. Approximate calculation of Franck-Condon factors on a computer

SOURCE: Optika i spektroskopiya, v. 19, no. 6, 1965, 871-873

TOPIC TAGS: oscillator theory, harmonic oscillator, molecular physics, computer ~~application~~ calculation, wave function

ABSTRACT: An expression is derived for Franck-Condon factors by substituting oscillatory wave functions previously calculated by the Wentzel-Kramers-Brillouin method (N. I. Zhirnov, Opt. I Spektr., 15, 166, 1963) in the formula for electron-vibrational transitions in a diatomic molecule. The resultant integrals are calculated on an electronic computer with a relative accuracy of 10^{-7}. The computer program is described. The system was used for calculating the Franck-Condon factors for a

Card 1/2

UDC: 539.192

L 13005-66
ACC NR: AP6001636

number of progressions of the second infrared band system in the CaO molecule. The results are compared with those obtained by numerical integration. Agreement is generally satisfactory and the exceptions are discussed. The authors take this occasion to thank F. S. Ortenberg for discussing the work. Orig. art. has: 1 table, 3 formulas.

SUB CODE: 20/ SUBM DATE: 29Oct64/ ORIG REF: 003/ OTH REF: 002

jrn

Card 2/2

AUTHOR: Zh[illegible]rnov, S. I.

ORG: None

TITLE: Regarding T. Tietz's note "eigenfunctions and eigenvalues of the rotational-oscillating states of diatomic molecules"

SOURCE: Optika i spektroskopiya, v. 19, no. 6, 1965, 990-991

TOPIC TAGS: diatomic molecule, molecular physics, eigenvalue, function

ABSTRACT: The author criticizes the position of T. Tietz (Nature, 201, 695, 1964), who proposed that the potential energy of a diatomic molecule be described by the function

$$U\ (r) = D_e\left[1 + \frac{A}{x^2} - \frac{B}{x} + \frac{n(n+1)C^2}{\gamma\,(1+Cx)^2}\right],$$

where $x = \frac{r}{r_e}$; $\gamma = \frac{2\mu r_e^2 D_e}{\hbar^2}$, and constants A, B, C, and n are determined from the conditions

$$U\ (r_e) = U'\ (r_e) = 0;\ U''\ (r_e) = k_e = 4\pi^2\mu c^2\nu_e^2$$

and the formula for constant a_e, linking oscillation and rotation

$$a_e = -\left[1 + \frac{r_e}{3k_e}\ U'''\ (r_e)\right]\cdot\frac{6B_e^2}{\nu_e}\ .$$

Card 1/2 UDC: 535.338.42.001.1

L 11404-66

ACC NR: AP6001664

It is briefly demonstrated that Tietz's premise is not correct. Orig. art. has: 10 formulas.

SUB CODE: 20 / SUBM DATE: 09Nov64 / ORIG REF: 001 / OTH REF: 004

Card 2/2

L 8604-66 EWT(d)/EWT(1) IJP(c) GG

ACCESSION NR: AP5021164 UR/0139/65/000/004/0028/0034

44,55

AUTHOR: Zhirnov, N. I.

38

TITLE: Probability of penetration of potential barrier in the generalized WKB method approximation. I. Possibility of refining the Miller-Good method

35

B

SOURCE: IVUZ. Fizika, no. 4, 1965, 28-34

21,44,55

TOPIC TAGS: nuclear potential barrier, Schrodinger equation, quantum theory, approximate solution

ABSTRACT: The possibility of further refinement of the Miller-Good method (Phys. Rev. v. 91, 174, 1953) for calculating the transparency coefficient is considered for a one-dimensional potential barrier with a single maximum. The problem consists of obtaining approximate solutions of the Schrodinger equation from the exact solution of an auxiliary equation by the generalized WKB method. The Eckart potential barrier is considered as an example. It is concluded that the transition in the quasiclassical Petrashen'-Fok approximation to a new basis chosen with allowance for certain requirements results in considerable refinement of the results obtained by the Miller-Good method. The new approximate method makes it possible to obtain correct information about the energy dependences of the transparency and

16,44,55

Card 1/2

L 8604-66

ACCESSION NR: AP5021164

3

reflection coefficients in a broader range of energies. The conditions for the applicability of the proposed method are less rigid than those of the Miller-Good and the WKB methods. The method is not well suited for small values of the energy. Orig. art. has: 1 table and 33 formulas.

ASSOCIATION: Moskovskiy pedinstitut imeni V. I. Lenina (Moscow Pedagogical Institute) 44,55

SUBMITTED: 07Oct63 ENCL: 00 SUB CODE: GP

NR REF SOV: 005 OTHER: 002

Card 2/2 pw

ZHIRNOV, Nikolay Ivanovich; KROL', Lazar' Borisovich; LIVSHITS, Emmanuil Moiseyevich; RABKIN, Yuriy Isaakovich; RADZYUKEVICH, Ye.I., red.; BORUNOV, N.I., tekhn. red.

[Large peak load water-heating boilers] Pikovye vodogreinye kotly bol'shoi moshchnosti. Moskva, Izd-vo "Energiia," 1964. 167 p. (MIRA 17:4)

L 7996-66 EWT(d)/FSS-2

ACC NR: AP5026490 SOURCE CODE: UR/0286/65/000/019/0025/0025

AUTHOR: Zhirnov, R. V.

ORG: none

TITLE: Device for synchronization of discrete automatic phase control. Class 21, No. 175082

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 19, 1965, 25

TOPIC TAGS: synchronous communication, phased locked communication

ABSTRACT: This Author Certificate presents a device for synchronization of automatic phase control. To decrease the netting time after temporary interruptions and to increase the freedom from interference, two logic "NO" and "OR" units are connected in series in the automatic phase control circuit. The units are controlled by exclusion and insertion pulses from two corresponding pairs of triggers using an auxiliary pulse sequence from a local master pulse generator.

SUB CODE: EC/ SUBM DATE: 16Oct63

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Card 1/1 UDC: 621.394.662.2

ZHIROV, S.

TSimliansk harbor making efforts for an early completion of the seven-year plan. Rech. transp. 19 no.11:5-6 N '60. (MIRA 13:11)

1. Nachal'nik TSimlyanskogo porta.
(TSimliansk Reservoir--Harbors)
(Cargo handling--Equipment and supplies)

ZHIRNOV, V. PA 239T47

USSR/Electronics - Radiofication Jan 52
Wired Radio Centers

"Increasing the Power of the KRU-2 Kolkhoz Wired Radio Center," V. Zhirnov

"Radio" No 1, pp 16-18

Describes a method worked out by the Moscow City Wired Radio Network lab for increasing the power of the KRU-2 to 10 va (with a harmonic content of less than 7%, measured at 400 cps). In this method, the IN3S (1N1) tubes of its output push-pull stage are replaced by 6P6S (6V6S) beam tetrodes and the plate of this stage is increased to 300 v.

239T47

ZHIRNOV, V.A.

[redacted] Theory of Halskii's bilocal fields. Zhur. eksp. i teor. fiz. 30 no.2: 425-426 F '56. (MLRA 9:12)

1. Fizicheskiy institut imeni P. N. Lebedeva Akademii nauk SSSR.
(Field theory)